

## BIOMORPHIC EXPLORERS

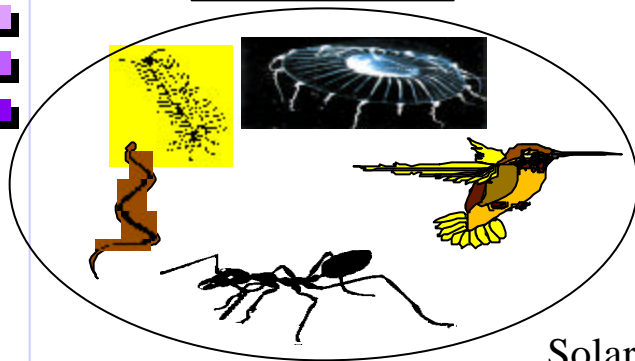
- **A MULTIDISCIPLINARY SYSTEM CONCEPT FOR SMALL, DEDICATED, LOW-COST EXPLORERS THAT CAPTURE SOME OF THE KEY FEATURES OF BIOLOGICAL ORGANISMS**
  - Small... 100-1000g (useful space/terrestrial exploration functions are implementable\* using this mass)
- **CONDUCTED WORKSHOP, AUG 19-20, 1998**
  - **SPONSORED BY NASA/JPL**
  - **WEBSITE: <http://nmp.jpl.nasa.gov/bees/>**
  - **AN ENTHUSIASTIC RESPONSE: OVER 150 PARTICIPANTS**

\* JPL DOCUMENT D-14879A, JPL DOCUMENT D-16300A,  
JPL DOCUMENT D-16500, AUTHOR: SARITA THAKOOR

BIOMORPHIC EXPLORERS  
1<sup>st</sup> NASA/JPL WORKSHOP ON

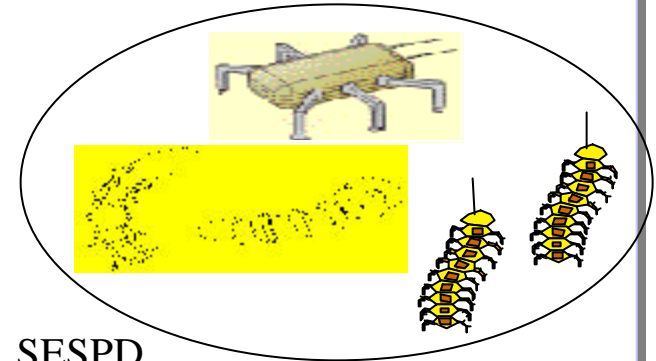
BIOMORPHIC EXPLORERS FOR FUTURE MISSIONS (BEES 98)

INSPIRATION



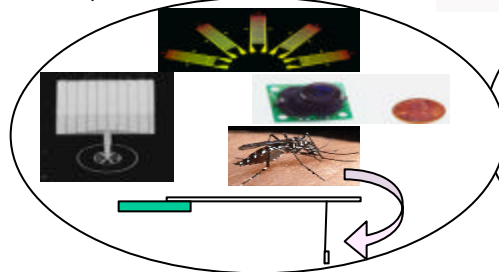
August 19 - 20, 1998  
Jet Propulsion Laboratory  
Pasadena, CA  
Auditorium 180 - 101

IMPLEMENTATION

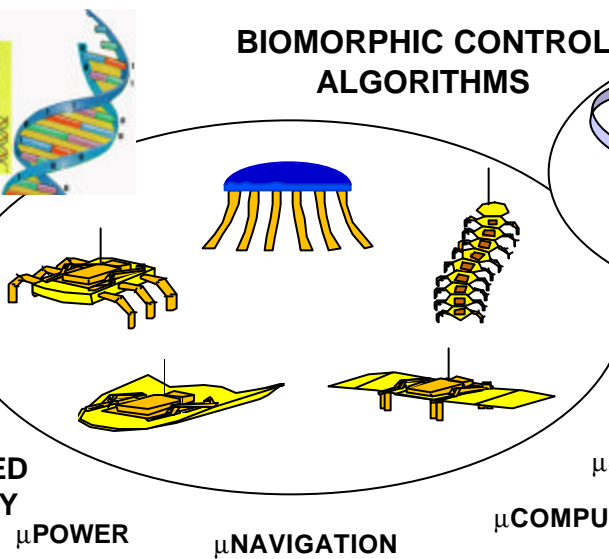


Sponsored by NASA/JPL  
Solar System Exploration Program, SESPD  
New Millennium Program, NMP  
Space Mission Technology Development Program, TAP  
Center for Integrated Space Microsystems, CISM

$\mu$ SENSORS



ADVANCED  
MOBILITY



BIOMORPHIC CONTROL  
ALGORITHMS

$\mu$ POWER

$\mu$ NAVIGATION

$\mu$ COMPUTING

$\mu$ COMMUNICATION  
TEMPERATURE  
CONTROL

$\mu$ STRUCTURE

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## THE CHALLENGE TO OBTAIN A BIOMORPHIC ROBOT

- **NATURE'S CREATIONS**
  - **PRIMARILY ORGANICS BASED**
  - **EVOLUTION LED SURVIVING DESIGN AND MINIMALIST OPERATIONAL PRINCIPLES ARE INHERENT**
  - **GEOLOGICAL TIME SCALE HAS BEEN USED FOR EVOLUTION**
- **BIOMORPHIC ROBOT**
  - **PRIMARILY INORGANICS BASED, THE INGREDIENTS/MATERIALS AVAILABLE TO US**
  - **NEEDS TO BE CREATED BY DISTILLING THE PRINCIPLES OFFERED BY NATURAL MECHANISMS. CAPTURING THE BIOMECHATRONIC DESIGNS AND MINIMALIST OPERATION PRINCIPLES FROM NATURE'S SUCCESS STRATEGIES**
  - **DO IT WITHIN A LIFETIME**